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This hoax—which would probably have succeeded with any journal—was palmed upon the *Morning Post,* which supported Mr. Goulburn, by some Cambridge wags who supported Mr. Lubbock, the other candidate for the University of Cambridge. Putting on the usual concealment, I may say that I always suspected Dr-nkw-t-r B-th-n-e of having a share in the matter. The skill of the hoax lies in avoiding the words "quadrature of the circle," which all know, and speaking of "the accurate rectification of a circular arc," which all do not know, for its synonyme. The *Morning Post* next day gave a reproof to hoaxers in general, without referring to any particular case. It must be added that although there are *caustics* in mathematics, there is no *lunar* caustic.

So far as Mr. Goulburn was concerned, the above was poetic justice. He was the minister who, in the old time, told a deputation from the Astronomical Society that the Government "did not care twopence for all the science in the country." There may be some still alive who remember this: I heard it from more than one of those who were present, and are now gone. Matters are much changed. I was thirty years in office at the Astronomical Society; and, to my certain knowledge, every Government of that period, Whig and Tory, showed itself ready to help with influence when wanted, and with money whenever there was an answer for the House of Commons.

(*To be continued.*)

THINGS WORTH NOTING.

3.—SOMETHING MORE ABOUT DE MOIVRE'S FORMULA.

Mr. Baron Maseres, in the preface to his cumbrous work on the *Principles of the Doctrine of Life Annuities* (1783, quarto), at p. xi., after referring to and commending for its utility the method for finding the value of an annuity on (x) in terms of that of an annuity on $(x+1)$, has the following:—

"This method was first communicated to me by Dr. Price, but it was published in the year 1779, by Mr. William Morgan, the actuary to the Society for Equitable Assurances, near Blackfriars Bridge, in his *Treatise on the Doctrine of Annuities and Assurances on Lives,* pp. 56, 57; and it had been published before by Dr Price himself, in his *Treatise on Reversionary Payments,* Note O of the Appendix, and likewise by Mr. Thomas Simpson, in his book on *Life Annuities,* Prob. 1, Coroll. 7; which last book was published so long ago as the year 1742. But I should suspect that it was not known to Mr. De Moivre when he calculated his tables of the values of life annuities; for, if it had, I should imagine he would hardly have thought it necessary to have recourse to a certain inaccurate hypothesis concerning the probabilities of life, in order to diminish the labour of his computations, which would have been almost equally facilitated by the use of this excellent method."

Could there be a more pregnant illustration than we have here of the danger of rash generalization? The learned Judge infers that, because De Moivre invented an hypothesis which enabled him to assign with considerable facility the value of an annuity on a life of any age, *therefore* the method referred to in the foregoing extract could not have been known to him. Why, not only was the method *known* to De Moivre, but it was actually *discovered* by him! And more than this, he *appears* (I say *appears*, because I desire to take warning from the example of the Baron) to have *abandoned* it in favour of his hypothesis.*

P. GRAY.

Camden Town, *8th June*, 1865.

CORRESPONDENCE.

ON THE CALCULATION OF PREMIUMS RETURNABLE AT DEATH OR WITHDRAWAL.

To the Editor of the Assurance Magazine.

SIR,—On looking over the pages of the last Number of the *Journal* I was struck with a paragraph in a letter signed J. W. Stephenson, wherein the writer professes to give a method of finding the single premium for a certain contingent benefit, with the condition that the premium shall be returnable (without interest) at death, and also in the event of the purchaser wishing to withdraw at any time before the benefit becomes payable.

Now, the determination of the premium required for the assurance of a given benefit, with the return of the premium *at death*, is a very simple matter; the latter contingency being perfectly susceptible of calculation. But as the contingency of having to pay a given sum on *withdrawal* (other than the surrender value of the policy) is not so, I was not a little curious to see how such a problem would be dealt with. The particular benefit discussed by Mr. Stephenson is a deferred annuity, and the following is, substantially, the reasoning by which he arrives at his solution.

Let P_x denote the single premium required; and suppose A, the intending purchaser, deposits this amount at interest in the hands of B, to be held at A's disposal until the time arrives at which the annuity is wanted—say at the expiration of n years. Let the yearly rate of interest which B allows A on his deposit be i per £1, which must also be the rate of interest assumed in the calculation.

With this yearly interest, amounting to $P_x i$, A is enabled to assure a deferred annuity (with forfeiture of premiums in the event of death) of $P_x i \cdot \frac{N_x - N_{x+n}}{N_{x+n}}$ per annum; and at the expiration of the period of n years

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* See p. 176.